IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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SERIAL NO. 08/945,144 : Art Unit: 1638

FILED: OCTOBER 14, 1997 : Examiner: D. Kruse

FOR: MUTATED 5-ENOL PYRUVYLSHIKIMATE-3-PHOSPHATE SYNTHASE, GENE CODING FOR SAID PROTEIN AND TRANSFORMED PLANTS CONTAINING SAID GENE :

APPENDICES 1-11 TO AMENDMENT (Rule 116)

Voted for 7 Nov. 2001

APPENDIX 1

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SELECTED EPSPS - RELATED PATENTS AND CLAIMS

4,535,060 - "Inhibition Resistant 5-enolpyruvyl-3-phosphoshikimate Synthase, Production and Use":

Claim 4: A DNA sequence of less than 5 Kb having a structural gene coding for a glyphosate resistant 5-enolpyruvyl-3-phosphoshikimate synthetase.

4,769,061 - "Inhibition Resistant 5-enolpyruvyl-3-phosphoshikimate Synthase, Production and Use":

Claim 7: A plant cell having a gene encoding for a mutated glyphosate resistant 5-enolpyruvyl-3-phosphoshikimate synthase enzyme, said gene being heterologous to said plant cell and under the transcriptional control of regulatory signals functional in said plant cell.

4,940,835 - "Glyphosate Resistant Plants":

Claim 1: A chimeric plant gene which comprises:
(a) a promoter sequence which functions in plant cells;
(b) a coding sequence which causes the production of RNA, encoding a chloroplast transit peptide/5-enolpyruvylshikimate-3-phosphate synthase fusion polypeptide, which chloroplast transit peptide permits the fusion polypeptide to be imported into a chloroplast of a plant cell; and
(c) a 3' non-translated region which encodes a polyadenylation signal which functions in plant cells to cause the addition of polyadenylate nucleotides to the 3' end of the RNA;
the promoter being heterologous with respect to the coding sequence and adapted to cause sufficient expression of the fusion polypeptide to enhance the glyphosate resistance of a plant cell transformed with the gene.

5,094,945 - "Inhibition Resistant 5-enolpyruvyl-3-phosphoshikimate Synthase, Production and Use":

Claim 17: A DNA sequence encoding a 5-enolpyruvyl-3-phosphoshikimate synthase comprising at least one mutation in the amino acid 90-110 region whereby said synthase is glyphosate resistant.

5,188,642 - "Glyphosate Resistant Plants":

Claim 8: A glyphosate-resistant dicotyledonous plant seed, said seed comprising a chimeric plant gene having:

i) a promoter sequence which functions in plant cells;

ii) a coding sequence which causes the production of RNA, encoding a chloroplast transit peptide/5-enolpyruvylshikimate-3-phosphate synthase fusion polypeptide, which chloroplast transit peptide permits the fusion polypeptide to be imported into a chloroplast of a plant cell; and

iii) a 3' non-translated region which encodes a polyadenylation signal which functions in plant cells to cause the addition of polyadenylate nucleotides to the 3' end of the RNA,

where the promoter is heterologous with respect to the coding sequence and adapted to cause sufficient expression of the fusion polypeptide to enhance the glyphosate resistance of a plant cell transformed with said gene.

5,804,425 - "Glyphosate-Tolerant-Enolpyruvylshikimate-3-Phosphate Synthases":

Claim 1: An isolated 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) enzyme having the sequence domains:

-R-X_1-H-X_2-E-(SEQ ID NO:37 [*i.e.*, ArgXaaHisXaaGlu]), in which

X_1 is G, S, T, C, Y, N, Q, D or E;

X_2 is S or T; and

-G-D-K-X_3 -(SEQ ID NO:38 [*i.e.*, GlyAspLysXaa]), in which

X_3 is S or T; and

-S-A-Q-X_4-K-(SEQ ID NO:39 [*i.e.*, SerAlaGlnXaaLys]), in which

X_4 is A, R, N, D, C, Q, E, G, H, I, L, K, M, F, P, S, T, W, Y or V; and

-N-X_5-T-R-(SEQ ID NO:40 [*i.e.*, AsnXaaThrArg]), in which

X_5 is A, R, N, D, C, Q, E, G, H, I, L, K, M, F, P, S, T, W, Y or V.

5,633,435 - "Glyphosate-Tolerant-Enolpyruvylshikimate-3-Phosphate Synthases":

Claim 4. A recombinant, double-stranded DNA molecule comprising in sequence:

a) a promoter which functions in plant cells to cause the production of an RNA sequence;

b) a structural DNA sequence that causes the production of an RNA sequence which encodes a EPSPS enzyme having the sequence domains:

-R-X_1-H-X_2-E-(SEQ ID NO:37 [*i.e.*, ArgXaaHisXaaGlu]), in which

X_1 is G, S, T, C, Y, N, Q, D or E;

X_2 is S or T; and

-G-D-K-X_3 -(SEQ ID NO:38 [*i.e.*, GlyAspLysXaa]), in which

X_3 is S or T; and

-S-A-Q-X_4-K-(SEQ ID NO:39 [*i.e.*, SerAlaGlnXaaLys]), in which

X_4 is A, R, N, D, C, Q, E, G, H, I, L, K, M, F, P, S, T, W, Y or V; and

-N-X_5-T-R-(SEQ ID NO:40 [*i.e.*, AsnXaaThrArg]), in which

X_5 is A, R, N, D, C, Q, E, G, H, I, L, K, M, F, P, S, T, W, Y or V; and

c) a 3' non-translated region which functions in plant cells to cause the addition of a stretch of polyadenyl nucleotides to the 3' end of the RNA sequence;
where the promoter is heterologous with respect to the structural DNA sequence and adapted to cause sufficient expression of the encoded EPSPS enzyme to enhance the glyphosate tolerance of a plant cell transformed with the DNA molecule.

6,225,114 - "Modified Gene Encoding Glyphosate-Tolerant 5-Enolpruvyl-3-Phosphoshikimate Synthase":

Claim 1. A DNA construct comprising in operative order:
(i) a promoter;
(ii) an intron;
(iii) a modified gene encoding a glyphosate-tolerant 5-enolpyruvyl-3-phosphoshikimate (EPSP) synthase enzyme with improved glyphosate tolerance wherein said modified gene comprises:
a first coding sequence encoding a first amino acid sequence:
-L-G-N-A-A-T-A (SEQ ID NO:26)
located between positions 80 and 120 of the mature EPSP synthase sequence encoded by said modified gene, and
a second coding sequence encoding a second amino acid sequence:
-A-L-L-M-x_1 -A-P-L-T- (SEQ ID NO:27)
wherein x_1 is either alanine, serine or threonine, and wherein said second amino acid sequence is located between positions 170 and 210 of the mature EPSP synthase sequence encoded by said modified gene; and
(iv) a 3' termination sequence;
wherein said promoter is heterologous to said modified gene.

5,866,775 - "Glyphosate-Tolerant-Enolpyruvylshikimate-3-Phosphate Synthases":

Claim 5. A gene encoding a glyphosate-tolerant 5-enolpyruvyl-3-phosphoshikimate (EPSP) synthase enzyme which encodes a first amino acid sequence:
-L-G-N-A-A-T-A-
between positions 80 and 120 in the mature EPSP synthase enzyme, and encodes a second amino acid sequence:
-A-L-L-M-X_1-A-P-L-T-
where X_1 is either alanine, serine or threonine, where said second amino acid sequence is located between positions 170 and 210 in the mature EPSP synthase enzyme.

5,312,910 - "Glyphosate-Tolerant-Enolpyruvylshikimate-3-Phosphate Synthases":

Claim 1: A plant gene encoding a glyphosate-tolerant 5-enolpyruvyl-3-phosphoshikimate

(EPSP) synthase, said EPSP synthase having the amino acid sequence:

-L-G-N-A-A-T-A-

between positions 80 and 120 in the mature EPSP synthase sequence.